REMARKS

Upon entry of this Response, claims 1-23 remain pending in the present application. Claims 21-23 have been amended. Applicant requests reconsideration of the pending claims in view of the following remarks.

In items 2 and 4 of the Office Action, claims 21-23 have been rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement and as being indefinite. Appropriate amendments have been made to claims 21-23 to address these grounds of rejection. Accordingly, Applicant requests that the rejection of claims 21-23 be withdrawn.

In addition, in item 6 of the Final Office Action, claims 1-20 have been rejected under 35 U.S.C. §103(a) as being unpatentable over US Patent 5,995,243 to Kerschner et al. in view of US Patent Application Publication No. 2001/0026011-A1 to Roberts et al. and US Patent 4,982,203 to Uebbing et al. A prima facie case of obviousness is established when the teachings from the prior art itself would appear to have shown or suggested the claimed subject matter to a person of ordinary skill in the art. In re Rijckaert, 9 F.3d 1531, 28 U.S.P.Q2d 1955, 1956 (Fed. Cir. 1993). Applicants assert that claims 1-20 are allowable over the cited combination of prior art references for the reasons that follow. Accordingly, Applicants respectfully request that the rejection of claims 1-20 be withdrawn.

To begin, claim 1 as previously amended provides:

> 1. A method for determining a light output of a light emitting diode (LED) in a scanner, comprising:
>
> applying a first current to the LED to generate the light output of the LED during a first time period;
>
> obtaining a first measure of the light output of the LED during the first time period with a number of sensors in a sensor array;
>
> applying an altered current to the LED to generate the light output of the LED during a second time period;
>
> obtaining a second measure of the light output of the LED during the second time period with the sensors in the sensor array; and
>
> detecting a saturation of the sensors in the sensor array by comparing a difference between the first measure of the light output and the second measure of the light output with a predefined difference threshold.

Claim 1 had previously been amended to include the step of "detecting a saturation of the sensors in the sensor array by comparing a difference between the

first measure of the light output and the second measure of the light output with a predefined difference threshold". In response the Office Action states:

> "Applicant argues that the combination of Kerschner, Roberts, and Uebbing does not teach detecting a saturation of the sensors in the sensor array using the comparison operation. The Examiner maintains that the combination of Kerschner, Roberts, and Uebbing teaches comparing the intensity signal to a target white point value to detect when the sensor intensity reaches the white point value, wherein the white point value corresponds to a maximum digital value. The instant specification, along with cited pertinent art, suggests or describes the general knowledge that a white value corresponds to the maximum intensity that the sensors can measure before saturating. Therefore, the combination of Kerschner, Roberts, and Uebbing meets the claimed limitation for detecting a saturation of the sensors." (Office Action, page 7).

In this regard, the Examiner erroneously assumes that the cited references and the specification of the present application teach that a white point corresponds to a maximum intensity that sensors can measure before saturating. Further, the Office Action states:

> "Further, since Kerschner discloses comparing the light intensity to detect a condition of the sensors reaching a white point/level indicating a maximum white digital value, <u>and since it is well-known in the art that the saturation levels of the light sensors correspond to the maximum white level, and Applicant suggests a relationship between determining the saturation of a sensor and its corresponding white level,</u> on page 4, lines 4-6 (Figure 8), page 8, lines 27-32, page 9, line 30 to page 10, line 7, Kerschner also discloses using the comparison to detect when the white point/saturation level of the sensors is achieved." (Office Action, page 5, emphasis added).

Thus, the Examiner assumes that detecting the condition of the sensors reaching a white point is the same as detecting a saturation level of the sensors. In doing so, the Examiner cites several portions of Applicants' specification. Applicants respectfully assert that in order to establish a prima facie case of obviousness, the elements of the claims must be shown or suggested in the <u>prior art</u>, not Applicants disclosure. Applicant asserts that the rejection of the present claims is improper to the extent that the Examiner relies on the present specification as teaching that a saturation level of a sensor is the equivalent to the white point.

Furthermore, the Examiner's assumptions are based upon an erroneous interpretation of both the specification of the present application and the cited prior

art references. Specifically, detecting a "white point" associated with a particular sensor is not the same as detecting a saturation of a sensor. For example, in one embodiment of the present invention, the detection of a saturation level is performed so that one can ensure that the white point is within the working range of the sensor and that the sensors are not saturated. Specifically, in Figure 8 of the present application, the flow chart describes a subroutine that verifies that an exposure time that was previously determined as described elsewhere in the specification does not result in the saturation or near saturation of any of the sensors for a maximum white value. In this respect, a process is undertaken in which exposure time is adjusted and the sensors are repeatedly scanned to determine an optimum exposure time in which all sensors are at least a predefined percentage away from saturation when a maximum white value is obtained for each sensors. In this process, malfunctioning sensors are disqualified from operation. Thus, the present application teaches that the white value is not actually the saturation value, contrary to the statements in the Office Action. (See Specification, page 18, line 15 through page 19, line 33).

In addition, Kerschner does not even mention saturation of the sensors. Rather, a scan of white level reference marks is performed and the sensor values obtained therefrom are compared to a predefined white value stored in a memory. If the sensor values do not equal the predefined white value, the duration of the pulse width applied to the LEDs is adjusted until the white value is achieved. Since there is inevitably process variation from sensor to sensor inherent in the manufacturing of sensors, there is no way of knowing whether any one of the sensors is saturated. Simply setting an exposure time so that white values are achieved does not guarantee that the sensors either are or are not saturated. In this respect, Kerschner teaches away from the concept of detecting the saturation level of the sensors as it does not take saturation into account, thereby leading one skilled in the art to believe that saturation of the sensors is not a concern in the operation of the scanner device.

In addition, the statement in the Office Action that the "Kerschner discloses comparing the light intensity to detect a condition of the sensors reaching a white point/level indicating a maximum white digital value" is irrelevant to the detection of saturation levels. The "maximum white digital value" is that obtained from an A/D converter that converts analog voltages from each of the sensors to a digital value. However, the analog voltages are amplified before being fed into the A/D converter. (See Kerschner, column 2, lines 15-16). In this respect, the "maximum white digital

value" may correspond to any predetermined sensed value along the range of output of the sensor, depending upon the rate of amplification. Thus, the statement in the Office Action that "it is well-known in the art that the saturation levels of the light sensors correspond to the maximum white level" is not founded in any teaching of Kerschner.

In view of the forgoing, Applicants' respectfully assert that the cited rejection of claim 1 fails to show or suggest at least the step of "detecting a saturation of the sensors in the sensor array by comparing a difference between the first measure of the light output and the second measure of the light output with a predefined difference threshold." Rather, the Office Action sets forth erroneous assumptions about the prior art that can only be based on hindsight reconstruction. Also, the Office Action fails to provide specific reference to those portions of the references teaching such subject matter.

For this reason, Applicant respectfully requests that the rejection of claim 1 be withdrawn. In addition, claims 7, 13, 19, and 20 include limitations similar in scope with those of claim 1 discussed above. Accordingly, Applicant requests that the rejection of claims 7, 13, 19, and 20 be withdrawn for the same reasons discussed above with reference to claim 1. In addition, Applicant requests that the rejection of claims 2-6, 8-12, and 14-18 be withdrawn as depending from claims 1, 7, and 13.

In addition, since the detection of the saturation of the sensors is not shown or suggested by the cited references, it is apparent that the rejection of claim 1 in this regard must be based upon the personal knowledge of the Examiner. When a rejection in an application is based on facts within the personal knowledge of an examiner, it should be specific as possible. 37 CFR 1.104(d)(2). When called for by the applicant, the examiner must support the assertion with an affidavit which is subject to contradiction or explanation by the affidavits of the applicant or other persons. 37 CFR 1.104(d)(2). Accordingly, Applicant expressly requests that either an affidavit be supplied by the Examiner as to the existence of facts or elements not shown or suggested by the references as described above, or that one or more references be cited that show such facts or elements.

In addition, Applicants further note that "When the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, it must indicate where such a teaching or suggestion appears in a reference." In re Rijckaert, 9 F.3d 1531, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993). Accordingly, Applicant respectfully

requests that the Office Actions state specifically where in cited references claimed elements are shown or suggested.

Also, claims 1, 7, 13, 19, and 20 also recite comparing a difference between the first measure of the light output and the second measure of the light output with a predefined difference. In addressing this limitation, the Office Action further states:

> "Uebbing teaches a method and apparatus for improving the uniformity of an LED printhead by compensating for the degradation in light output of a plurality of LEDs (column 4, lines 66-68) comprising obtaining the light output measures of two different pulse-width values and comparing the difference between these values to determine the percentage increase, of the second measure relative the first measure, needed to meet the desired output level deviation/difference (in this case zero (column 5, lines 1-22)."

Applicants disagree with the above contention. Specifically, Uebbing does not teach the above-stated subject matter. Specifically, the cited section of Uebbing states:

> "In order to provide compensation for the variations in light output between LEDs due to aging, the amount of degradation in light output is predicted. By predicting the percentage amount of degradation, D_g, in light output and increasing the exposure time by the same percentage, compensation for the amount of degradation due to varying effects of age on each LED is accomplished.
>
> The percentage degradation is defined in terms of the light output, q, at time t and time 0:
>
> $$\text{Percentage degredation} = Dg\left[1 - \frac{q(t)}{q(0)}\right]100\%$$
>
> For example, if the first measurement of the light output of LED using a photodetector is 100 nanovolts and the second measure of the same LED is 90, the percentage amount of degradation is 10 percent.
>
> $$D_g = [1 - (q(t)/q(0))]100\% = [1 - 90/100]100\% = 10\%$$
>
> Therefor, the pulse width of the actuating pulse D_1, which is equal to the exposure time, is increased by 10% to compensate." (Column 4, line 66 – Column 5, line 23).

Thus, Uebbing merely teaches the fact that the light output of an LED will degrade over time and that such degradation may be measured. Uebbing does not specifically teach or suggest "obtaining the light output measures of two different pulse-width values and comparing the difference between these values to determine

the percentage increase" as the Examiner contends. In fact, Uebbing merely discusses uniform illumination using LEDs for a print head—the apparatus of Uebbing doesn't even have sensors to measure the light output of the LEDs in the first place. Also, Uebbing does not measure the light output at "two different pulse-width values". To do so would distort the measure of degradation that Uebbing seeks to obtain. That is to say, changing the pulse-width values would result in different light outputs due to both the change in pulse-width values and degradation. Uebbing would not be able to isolate the degradation sought. Also, Uebbing does not compare a difference between measured values to a predefined value. Consequently, Uebbing fails to show or suggest the concept of obtaining different measures of light output and comparing a difference between the measures with a predefined difference threshold as claimed in claims 1, 7, 13, 19, and 20.

Accordingly, for this additional reason, Applicants respectfully requests that the rejection of claims 1, 7, 13, 19, and 20 be withdrawn. In addition, Applicants requests that the rejection of claims 2-6, 8-12, and 14-18 be withdrawn as depending from claims 1, 7, and 13.

In addition, where the structure or text of prior art suggest something other than the instant invention, then they teach away from the invention and, ultimately, do not suggest the creation of the invention. Akzo N.V. v U.S. Intern. Trade Comm., 808 F.2d 1471 (Fed. Cir. 1986), *cert. denied*, 482 U.S. 909. Uebbing teaches away from the concept of actually comparing measured values obtained using different currents applied to an LED to a difference threshold to determine a saturation of sensors. Specifically, Uebbing teaches ***estimating*** a degradation of the light output of the LEDs over time ***using predetermined equation***. It does not teach finding a saturation value of an LED by comparing two measured light outputs with a predefined difference value. Specifically, Uebbing further states:

> It has been discovered that the percentage degradation as a function of time may be modeled by the equation:
>
> $$D_g = k_D t^{1/3}$$
>
> where k_D is a constant which is a characteristic of each LED and t is the amount of time that the printhead has been operating. The constancy of k_D for each LED allows the future light output of a specific LED to be accurately predicted when the LED age is known." (Column 5, lines 34-44).

With regard to the above equation, Uebbing also states:

> "The percentage amount of Degradation D_g is predicted using equation (3) by substituting the amount of time the printhead has been operating for the variable, t. It will be appreciated that the operation time of the printhead may be determined in a number of different ways." (Column, 5, lines 49-54).

Thus, Uebbing discusses the use of an equation to calculate an estimate of LED degradation to establish a difference in LED light output due to such degradation. In this respect, Uebbing teaches away from actually measuring light outputs and comparing a difference between such measurements to a predefined difference threshold. In this respect, the above portion of Uebbing cited in the Office Action is taken entirely out of context of the full teaching of Uebbing. Thus, it is apparent that any citation to Uebbing in rejecting the present claims can only be the product of hindsight reconstruction using the claims of the present application as a blueprint.

Thus, Applicants assert that the rejection of claims 1-20 based upon a combination of Kerschner, Uebbing and Roberts is improper. Accordingly, for this additional reason, Applicants respectfully request that the rejection of claims 1-20 be withdrawn.

In addition, where multiple references are relied upon in combination for an obviousness rejection, there must be some teaching, suggestion, incentive or inference to make the proposed combination. Carella v. Starlight Archery, 804 F.2d 135, 231 USPQ 644 (Fed. Cir 1986). In citing motivation to combine Kerschner and Uebbing, the Office Action states:

> "It would have been obvious to one having ordinary skill in the art to modify the invention of Kerschner to include comparing the difference between first and second light outputs to the threshold to alter the current values by a predefined percentage, as taught by Uebbing, because while the invention of Kerschner requires a trial-and-error repetition method to obtain a desired output, the invention of Uebbing suggests a method that would quickly and accurately determine the required change in intensity, and corresponding current modification, with minimal time and effort (column 5, lines 1-32)." (Office Action, page 6).

Applicants respectfully assert that this statement is nonsensical in view of the fact that Uebbing doesn't even have sensors in the apparatus discussed therein. How could the apparatus of Uebbing suggest a method that would quickly and accurately determine the change in intensity when there are no sensors to measure the

intensity in the first place? Uebbing discusses the prediction of an illumination response, not the response of the sensors to the illumination as there are no sensors in Uebbing. In this respect, Uebbing teaches away from the combination of Uebbing and Kerschner. Also, the fact that Uebbing does not even employ sensors illustrates the fact that the citation of Uebbing in combination with Kerschner can only be the product of hindsight reconstruction. Given that there is no motivation to combine at least Uebbing and Kerschner, Applicants assert that the cited combination is improper. For this reason alone, Applicant request that the rejection of claims 1-20 based upon the combination of Uebbing and Kerschner be withdrawn.

CONCLUSION

Applicants respectfully request that all outstanding objections and rejections be withdrawn and that this application and all presently pending claims be allowed to issue. If the Examiner has any questions or comments regarding Applicants' response, the Examiner is encouraged to telephone Applicants' undersigned counsel.

Respectfully submitted,

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